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(12) **United States Patent**
Lantsman

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(54) **DC PLASMA POWER SUPPLY FOR A SPUTTER DEPOSITION**

6,051,114 A * 4/2000 Yao et al. 204/192.3
6,190,512 B1 2/2001 Lantsman 204/192.12

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OTHER PUBLICATIONS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

English abstract of JP 2-254160.*
Rossnagel, "Handbook of Plasma Processing Technology", Noyes Publications, 1990, USA, pp. 47-58.
Wasa, "Handbook of Sputter Deposition Technology", Noyes Publications, 1992, USA, pp. 97-122.
Roth, "Industrial Plasma Engineering", Institute of Physics Publishing, 1995, United Kingdom, pp. 283-390.

(21) Appl. No.: **09/838,039**

* cited by examiner

(22) Filed: **Apr. 20, 2001**

Related U.S. Application Data

Primary Examiner—Steven H. VerSteg

(60) Provisional application No. 60/207,453, filed on May 30, 2000.

(57) **ABSTRACT**

(51) **Int. Cl.**⁷ **C23C 14/34**

DC plasma power supply for a sputter deposition of material layers on a substrate includes a plasma controller and a plasma input for the settings of the output voltage and output current providing plasma ignition and termination with no arcing and no striking voltage. Pre-defined voltages are applied in the vacuum state before sputtering and after sputtering until vacuum is restored in a sputtering apparatus.

(52) **U.S. Cl.** **204/298.08; 204/298.03**

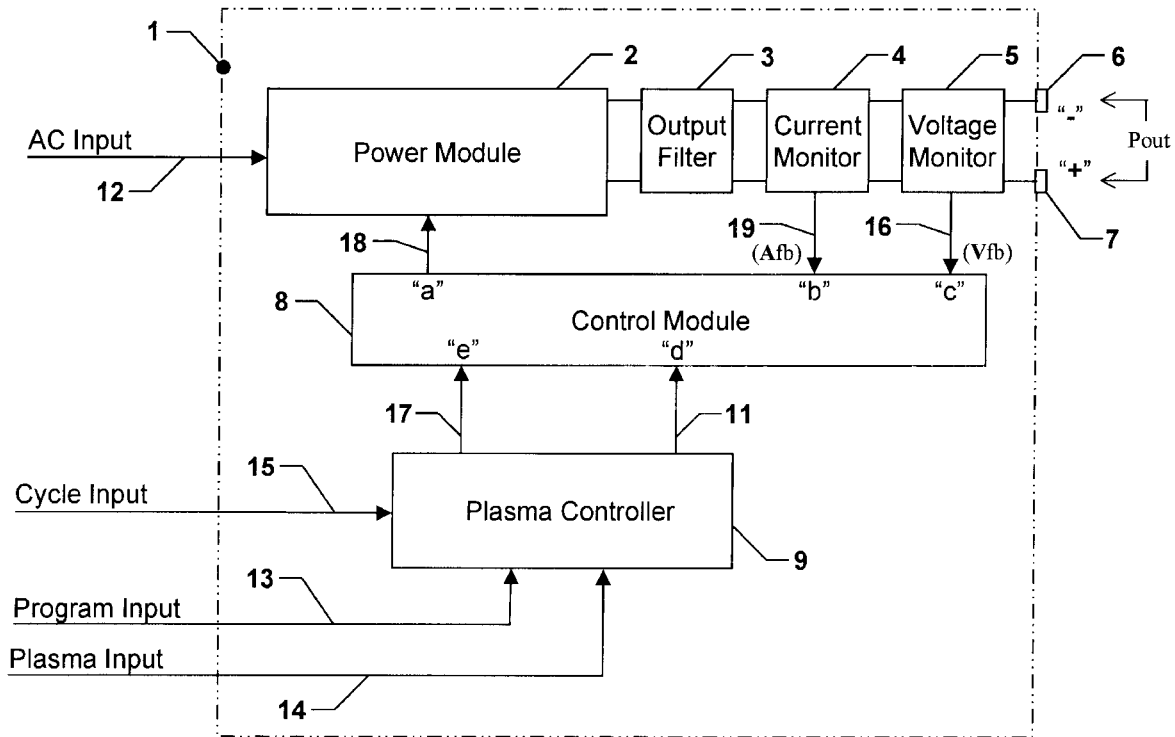
(58) **Field of Search** 204/192.13, 298.03, 204/298.08; 323/234, 205, 299, 318, 304

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,007,879 A * 12/1999 Scholl 204/192.12

20 Claims, 11 Drawing Sheets



GILLETTE 1000

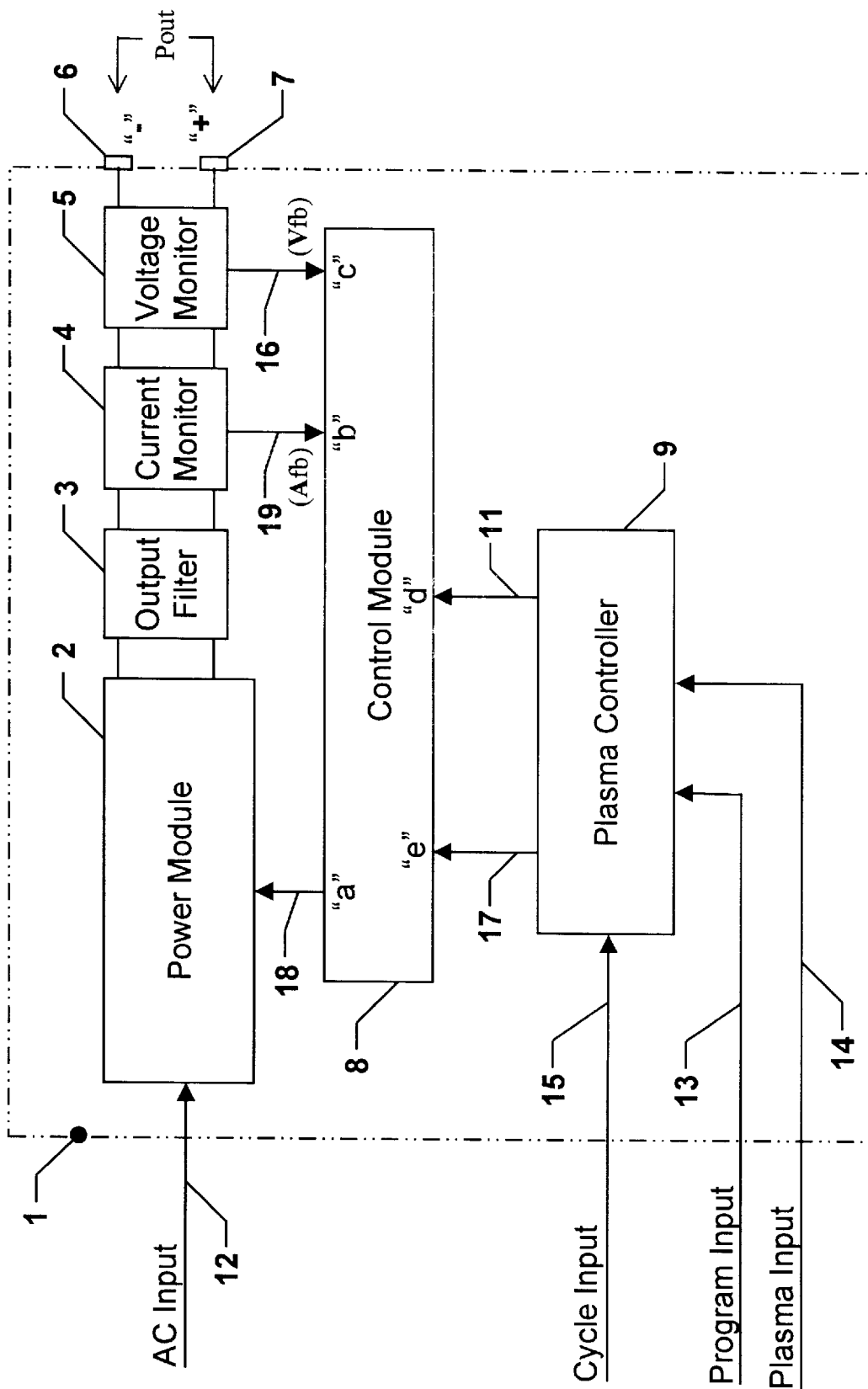


Fig. 1

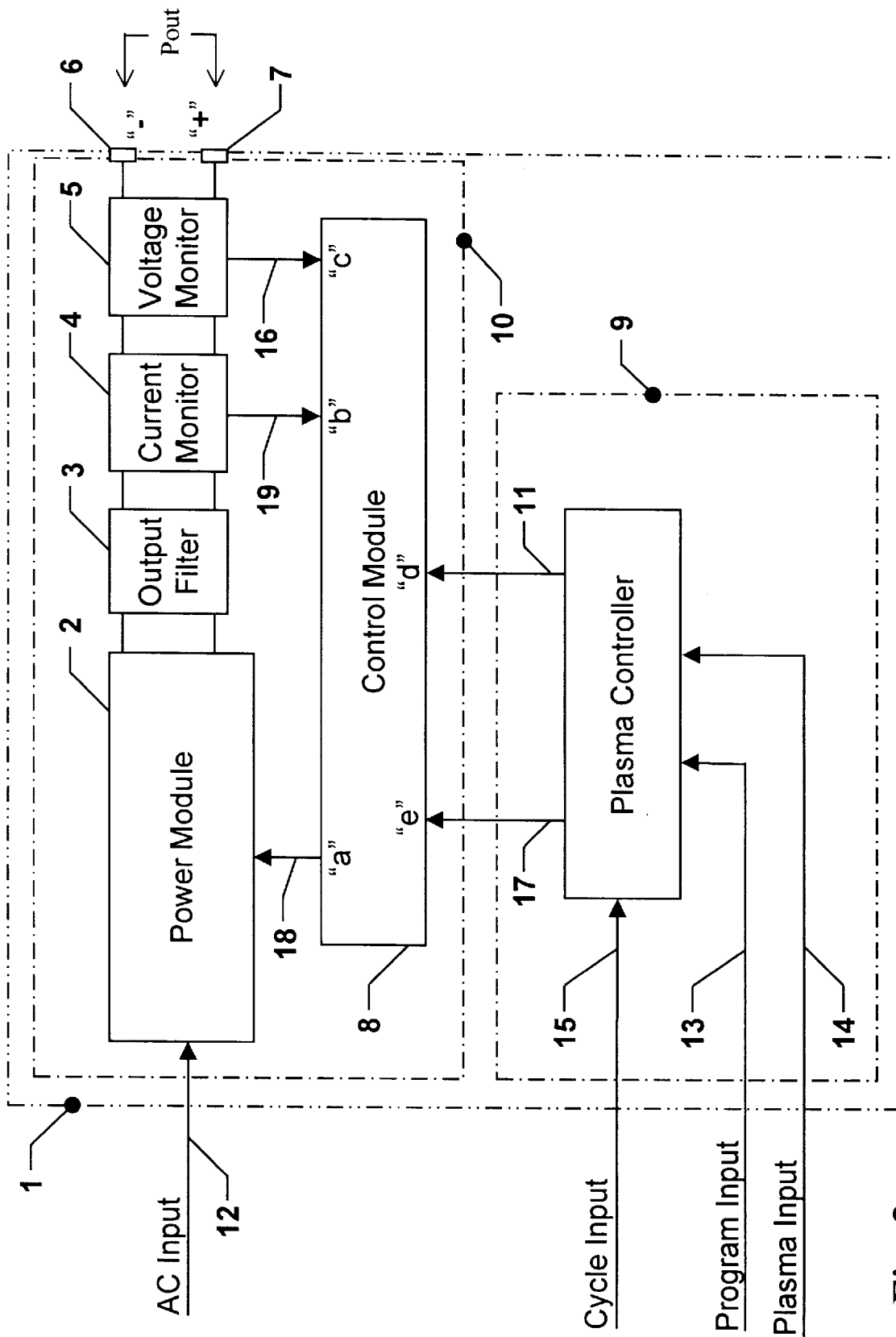


Fig. 2

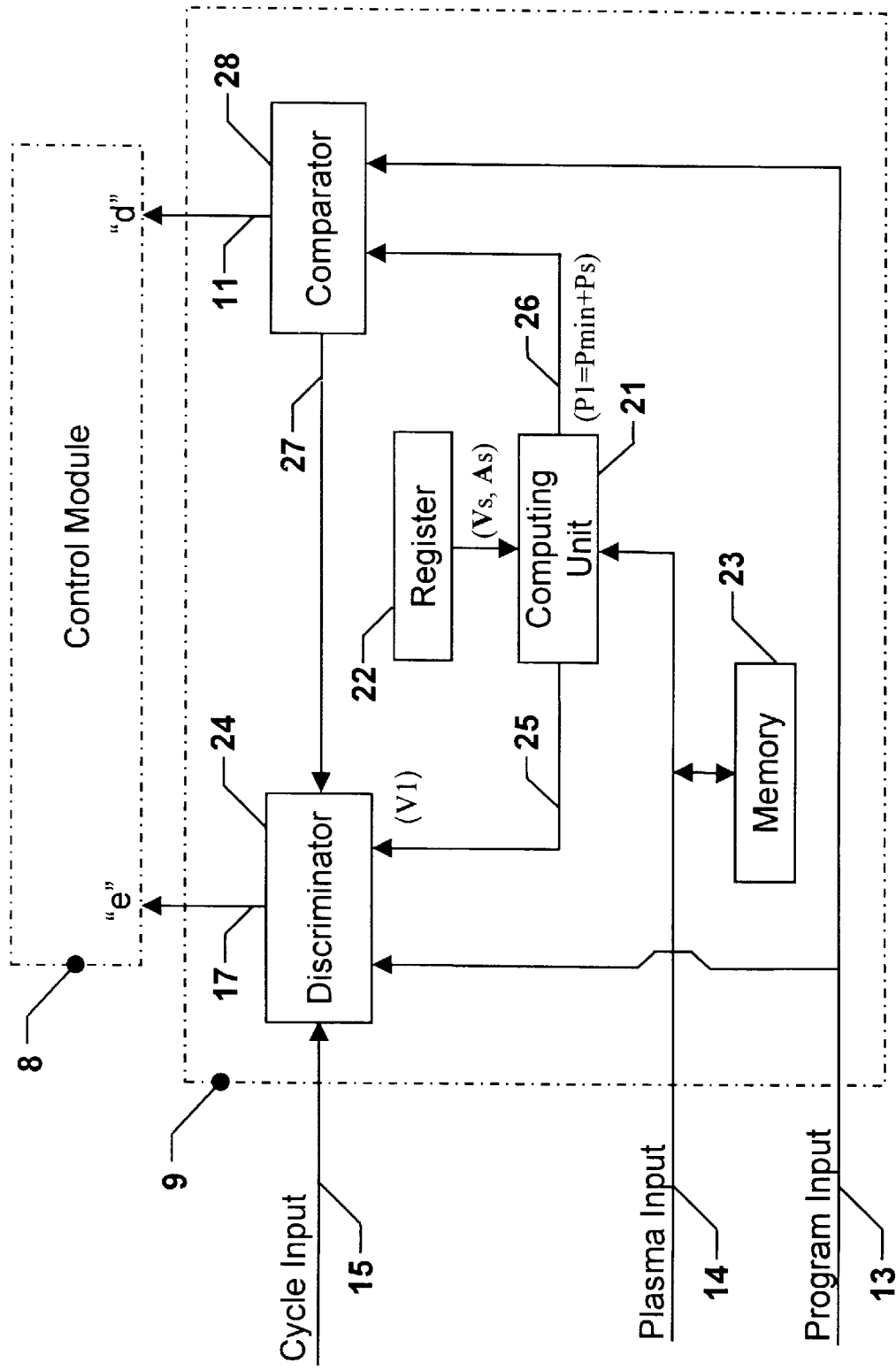


Fig. 3

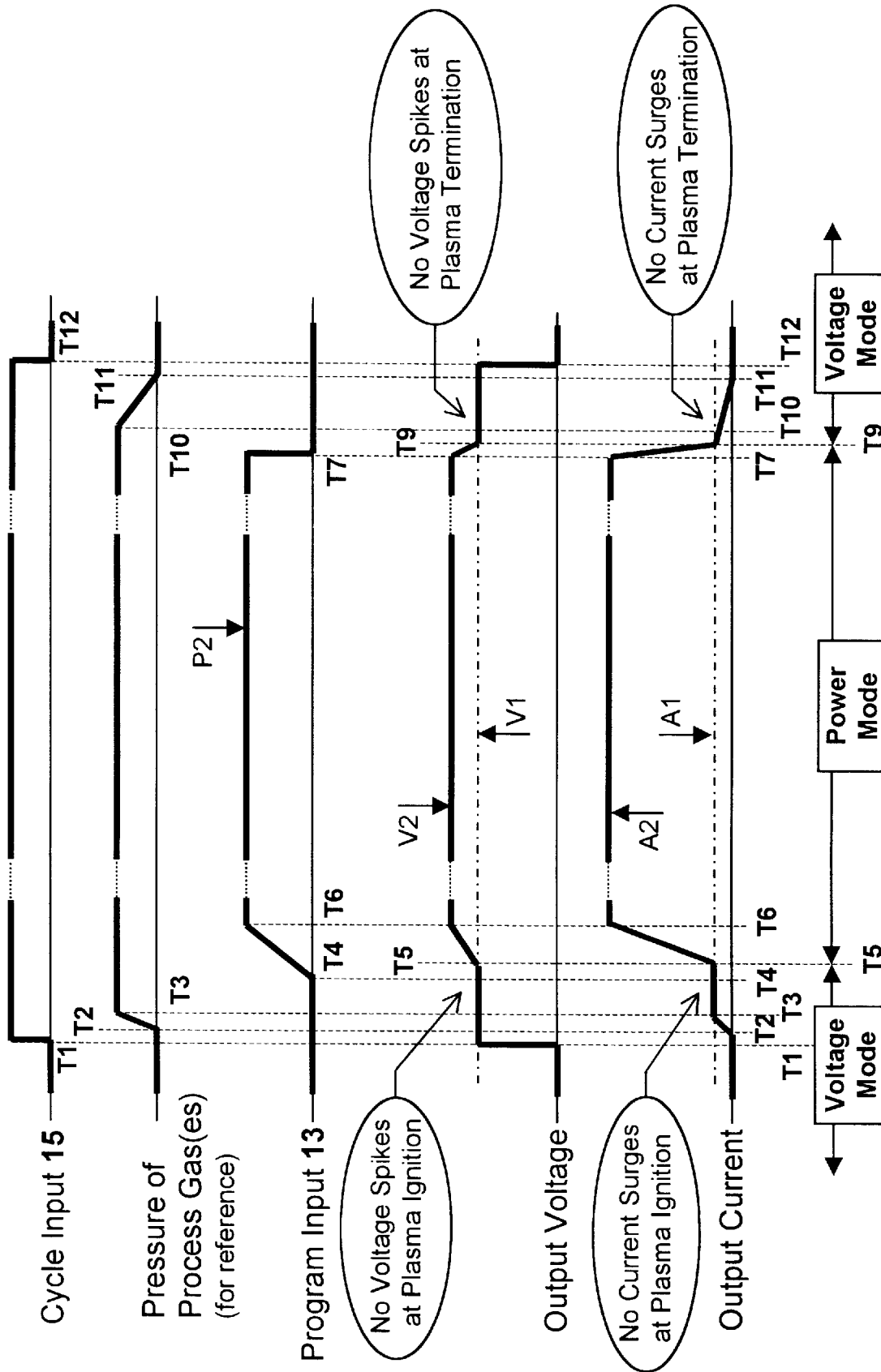


Fig. 4

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